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CANONICAL DOMAINS IN SEVERAL COMPLEX VARIABLES

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The main purpose of this paper is to give the function which maps a bounded domain onto the m-representative domain ($m \geqq 1$) (hereafter called *m-representative function*) without utilizing the minimum problems in the case of several complex variables. One of the results obtained is that a m-representative domain becomes also a $(m+1)$-representative domain.

Let D be a bounded domain and $k_D(z, \bar{t})$ $z, t \in D$ be the Bergman kernel function. Recently M. Maschler [7] made use of the minimum problems to establish the m-representative function in one variable:

$$\text{(I)} \qquad w(z) = \frac{M_D^{010\cdots0}(z, t_0)}{m_D^{10\cdots0}(z, t_0)} \text{ fixed } t_0 \in D ,$$

where $M_D^{010\cdots0}(z, t_0)$, $m_D^{10\cdots0}(z, t_0)$ are both Maschler's minimizing functions and represented in a closed from by using $k_D(z, \bar{t})$ and its derivatives, respectively. Moreover this result has been generalized successfully by T. Tsuboi [13] in the case of several complex variables. In this case, however, for example the 2-representative function of a unit circle is nonregular if we choose a fixed point t_0 in $1/2 < |t_0| < 1$.

In this paper we consider the following m-representative function of other type which coincides with the ordinary Bergman representative function when $m = 1$ (§ 4):

$$\text{(II)} \qquad w(z) = \int_{t_0}^{z} N_D^{E_n 0\cdots0}(z, t_0)dz ,$$

$$N_D^{E_n 0\cdots 0}(z, t_0) \equiv (E_n 0 \cdots 0)\begin{pmatrix} T_D(t_0, \bar{t}_0) & \cdots & \dfrac{\partial^{m-1}}{\partial z^{m-1}} T_D(t_0, \bar{t}_0) \\ \vdots & & \vdots \\ \dfrac{\partial^{m-1}}{\partial t^{*m-1}} T_D(t_0, \bar{t}_0) & \cdots & \dfrac{\partial^{2(m-1)}}{\partial t^{*m-1}\partial z^{m-1}} T_D(t_0, \bar{t}_0) \end{pmatrix}^{-1} \cdot \begin{pmatrix} T_D(z, \bar{t}_0) \\ \vdots \\ \dfrac{\partial^{m-1}}{\partial t^{*m-1}} T_D(z, \bar{t}_0) \end{pmatrix},$$

where the matrix function $T_D(z, \bar{t})$(for definition, see § 1) is, as is well known, relatively invariant under any pseudo-conformal mapping. We define in § 1 the relative invariant $T_{2D}(z, \bar{t})$, which plays an